

INTERSPACE

THE EUROPEAN SATELLITE & SPACE NEWS

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IMPORTANT NOTICE

WE ARE TAKING OUR SUMMER BREAK FOLLOWING THIS ISSUE. OUR NEXT ISSUE WILL BE ON 20 SEPTEMBER 1985.

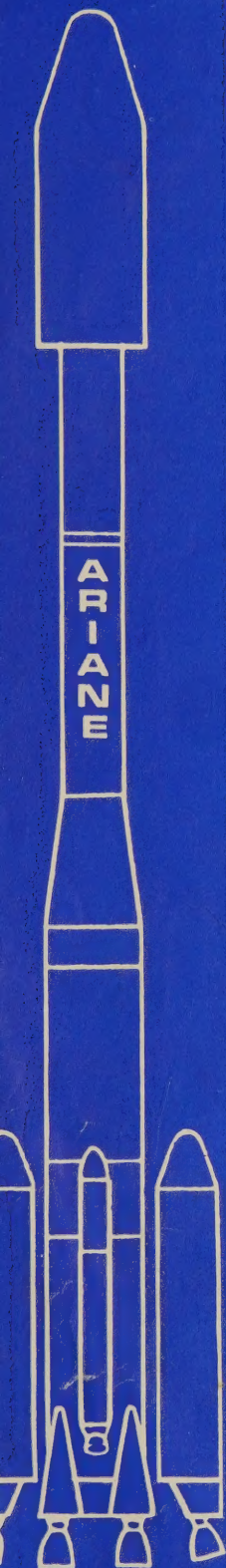
IIC REPORT OUTLINES TELECOMS POLICY PROBLEMS

* New report published by the International Institute of Communications, called "From Telecommunications to Electronic Services", covering recent policy developments in Western Europe, Japan and North America, lightests contrasts and weakness, as identified by lawyers, Principle problems, identified in Europe is inherent conservatism in maintaining monopoly institutions and divergencies of policies between European nations and consequential conflicts of interest. Report also emphasises need for good policies, the lack of which can have a major impact on the economic performance of a country. It, for example, criticises the lack of significant restructuring of tariffs in West Germany, which it claims will lead to large business users trying to avoid using that country. It says that France has begun to reformulate tariff policies and that the USA, Britain and Japan are amongst the most advanced in this area. However, it states the UK Government aims have been contradictory and inconsistent in formulating Telecoms policy, a position already clearly stated by Interspace, we would add.

The two ideas that an organization like British Telecom can be sold off to private investors for a maximum price and competition can be introduced into telecommunications inevitably lead to conflicts of interests between the telecom user and the government and BT shareholders. The IIC, incidently, expresses doubts if the monopoly regulator

in the UK, Oftel (Office of Telecommunications) has the teeth to effectively undertake its task - Oftel has, in no uncertain terms, already been told to push-off by BT in its attempts to influence BT's sourcing of equipment. It perhaps misses the point in criticising Oftel - the problem is weak policy making off which Oftel is the product, not the cause.

As everyone in the industry knows, the need to develop new telecommunications policies has been created by three factors, the most important of which (we believe) is the supply side factor of a plethora of new information and communications technology using electronic developments achieved in the last quarter century. Secondly, and related, is increased demand, both in volume and variety of services, created by developments in information technology, the changing nature of economic activity and economic growth. Thirdly, and particularly spurred by the lead taken by the USA, is the general trend in the Western World away from nasty, large an unenterprising bureaucracies towards entrepreneurship, competition, innovation and, what is not so obvious, the consequential need to decentralize decision taking, brought about by the requirements of many more, complex, and more frequent decisions. It is the future of national administrative frameworks to adjust their structures and capabilities which we humbly believe is the prime cause of many of the poor policy decisions taken in Western Europe.



The IIC report, for example, admits that in the UK, that a policy of liberalization of telecommunications could be frustrated because too many different parts of government (and therefore the Civil Service) are involved. Modern structures and management techniques are largely absent from the British Civil Service. Although the service does attract people of calibre, they are still remarkable thin on the ground. Moreover, the Service still places grossly insufficient weight on educational achievement, still relying on a small annual intake of academically good recruits from Oxbridge but with little regard to the nature of their academic achievements. Unlike the Civil Service apparatus in France it fails to recognize the importance of good, sound understanding of modern management, technology and economics as a partner to personal qualities and the need for a much larger cadre of such Civil Servants to overcome the inertia and inherent conservatism of stodgy outfits like the Civil Service. The Civil Service's able young Turks are far too thin on the ground to be effective. Nor do we believe that there are many people in the Civil Service who are aware of the problem.

Within the structure of the telecommunications industry, the maintenance of a centralized monopoly, does not facilitate the decentralization of decision taking and profit motive needed to introduce new services and technologies. There are currently two major areas where, we believe, new services would be best facilitated by new organizations. These are in telecommunications services provide as part of new cable tv networks and in satellite communications. Mercury Communications can get into the former (but as yet, hasn't); BT already has its own vested interests in the latter through Eutelsat and Intelsat. Legislation currently prevents any one else coming in. Profit making BT will undoubtedly wish to protect its interests in Eutelsat and Intelsat instead of perhaps writing of those interests in using other people's proposed new capacity (Orion, ISI, EBS etc) or developing its own systems. Indeed, it is left to the reader's judgement to decide if users could be better off making their own choice to use whatever satellite is on offer and negotiate directly with the satellite operator or transponder broker. We are faced in Europe with the possibility of having part ownership by PTT's of two satellite systems. Eutelsat and Intelsat, both of which currently have a large amount of partly used or unused transponder capacity, as well as the Telecom 1 system, but not a single transponder broker in the whole continent. European PTT's have no natural monopoly on ability to best market transponder capacity; nor is there a strong argument that the

requirements of an integrated telecoms network dictate national PTT* monopolies on marketing capacity. Distribution of tv channels via satellite to cable networks does not necessarily involve any PTT terrestrial equipment and certainly not on the downlink side.

Yet a a tv programmer using either Intelsat or Eutelsat has to negotiate for capacity not through Intelsat or Eutelsat but through their National PTT's and on prices set by the PTT's.

Eutelsat may no doubt argue that the allocation of its space segment to national PTT's for onward lease to users or direct use by the PTT's for obvious common carrier traffic (Cable TV programming is not, from an economic definition, naturally defined as common carrier type traffic), reflects demand in European countries. But such allocation is a priori. There is no direct price mechanism to allocate capacity, particularly amongst cable tv programmers. For the latter to be on the "right bird" is valuable and has an economic price in the competitive resource allocation methodology economics.

We suggest that one option for European countries is to divest their PTT international operations (where not already done) from domestic activities as one step to formulating telecoms policy. Such an approach is at least in step towards reducing the problem of cross subsidization of services within PTT's and a step towards decentralization of decisions taking. A second step would be to allow the international side to obtain international capacity wherever it best suits user requirements. This suggests, for example, that BTI would have no direct interest in Eutelsat or Intelsat. The approach suggested at least allows policy makers to grapple with the problem of liberalization of public telecommunications services whilst extending the existing liberalization in basic transmission services. In the latter, the new services to be offered by budding North American satellite operators (Orion, RCA Americom etc) is likely to place increasing pressure on policy makers.

We already know in Europe that there is no direct need for a PTT buffer between a satellite user and a satellite operator. This is the essential, although partly fudged, principle behind Luxembourg's SES proposals, although the uplink side (from Luxembourg and not in the user's country) remains a potentially costly problem.

The IIC report also warns about the way in which national satellite services are proliferating in a largely unco-ordinated way and leapfrogging terrestrial networks. Again, part of the problem is allowing PTT monopoly power over transmission services as well as public telecoms. There is no

price mechanism pushing allocation of resources away from national domsats, for example, to regional systems probably better suited in the long run to European needs, or into, say transatlantic domsat services. Indeed there is a conflict between national aerospace policies and telecom policies. The IIC report suggests that some countries may wish to push satellite services into the private sector to avoid the heavy investments and high risks involved. Japan is in effect already doing this and Eutelsat has argued that it reflects the spreading of financial investment and of high risks in an unproven market amongst European PTT's. The latter argument is a bit weak when two major PTT's in Europe - France and Germany's, are well into establishing their own domsat systems.

ENCRYPTION FOR UK TYRO MARKET

* At a time when UK cable programmers are looking for a common standard for encryption, satellite TV Antenna Systems MD Peter Gray suggests that a short term alternative for them to collect revenue from individual TVRO users is a fee collected at point of sale of the TVRO systems and included in the price of the equipment. The approach is not a long term solution but would give the industry time to introduce cheap decoding equipment as well as provide programmers with revenue. Peter Gray points out that unless the programmers have a proper marketing plan to collect revenues from TVRO users, then they appear to have no legal basis to insist upon payment for reception of their TV channels by the user. However, the legal case could be strengthened if a fee is collected at the point of sale before the programmers begin encryption. Payment of the fee by the purchasers could be seen as tacit agreement that continued payments would be necessary to the programme providers. However, if the programmers fail to follow up with encryption, they still have no way of proving that any TVRO owner is actually watching their channel. There is no method by which they can gain entry into a home to prove that a TVRO owner is watching their programmer. The TVRO owner is also likely to say he brought the equipment to watch other channels, including the ad-supported programming from, say, Sky Channel.

Gray admits in the long run that encryption is the only answer but price and quality remains a problem particularly in the absence of any volume demand and production. The UK Cable Programme Providers Group is expected to issue an RFP later this month to manufacturers for decoder equipment. However, there appears to be some

disagreement between programmers as to an acceptable retail price of the equipment. It is not clear at this stage what industry could offer, particularly in the absence of volume. Sales of TVRO equipment have yet to boom in the UK and the retail industry is still dipping its toe in the water to test the market. Thorn, EMI's TV rental chains, DER, Radio Rentals and Multi Broadcast and Dixons, the consumer electrical outlet, are intended to demonstrate TYRO equipment in larger outlets by Christmas and are not the type of specialist retail outlet of TYRO equipment that has developed in the USA. Granada group is still evaluating equipment and has not made a decision on retailing it. So called top peoples shop, Harrods, will be demonstrating the equipment in time for Christmas.

BELGIAN WPN CHANNEL: 3 MILLION VIEWERS BY THE END OF THIS YEAR ?

SLOTS BEING OFFERED TO GOVERNMENTS

* World Public News channel is the first satellite news channel in Europe to broadcast in Western Europe through Eutelsat I - F1 (via the repeater leased by Belgian RTT from Eutelsat). WPN, transmitting six hours and half per day, from 0800-1200 and 1400-1630 European time, is managed and promoted by the Belgian company ITS (Independent Television Services) located in Brugge. WPN is still an experimental channel but already expanding through Europe - mainly in Belgium and in the Netherlands, it is becoming an operational service. ITS is offering the WPN channel capacity to governmental broadcasters for reports, documentaries and news about their countries. This public broadcasting information, according to WPN plans, will be presented in 13-minute sequences, each followed by 2 minutes of news presented by a speaker. WPN is transmitted to Eutelsat I-F1 from the Liederkerke RTT station and is created in studios at Brussels.

"Programmes" of WPN are broadcast in English and in French with Dutch subtitles", Mrs Liese Demol, Network Co-ordinator of ITS, told us, "We have signed a contract with UNESCO for educational broadcasts. We already are broadcasting programmes from Israel, Jordan, USA free of cost, for a promotional campaign of one month. We are negotiating with US Information Agency a contract for the distribution of the Worldnet channel to European cable systems. At this time, Worldnet is broadcast by the French repeater but only for US embassies and representatives. ITS is offering part of its transponder lease time for Worldnet. A delegation from ITS will go, next month, to Washington DC to negotiate with the State Department".

But could every country utilize the WPN channel for its propaganda? Mrs Demol replies: "Any nation admitted by the UNO is authorized to broadcast its programmes via WPN. Even the Soviet Union or an Eastern European country. The USA Information Agency has been informed about the possibility of a Soviet or communist presence on our channel. We would welcome Eastern reports and news in order to balance the Western character of WPN programmes. South Africa will not be admitted in our programmes."

What about the cost for a government to broadcast over Europe via WPN? "This cost, established for 13-minute periods, depends on the frequency and duration of the required broadcasts, Mrs Demol says. The average price for one 13-minute period is 910 ECU or 700 dollars as basis for negotiations."

WPN is being distributed experimentally on the Integan cable network in Antwerpen which has 168,000 subscribers; on 14 August, it entered the Netherlands for distribution on the Helmond cable net consisting of some 20,000 subscribers. ITS hopes to offer WPN to major cable systems in the Netherlands during the next few weeks. Mrs Demol states: "We are negotiating with the Flemish and Walloon authorities for WPN reception by the Belgian cable networks. Sky Channel has opened the way in the French part and it is a commercial channel. WPN is not a commercial channel with advertising and our situation appears easier to be solved. We hope that our authorization in Belgium will not take the three years Sky Channel has needed to obtain its entrance ticket for Belgium...."

BELGIAN GILLAM COMPANY GEARING UP FOR DBS

* Set-up in 1974 by Michael Gillard and Jean-Paul Lambrechts, the Gillam company specializes in equipment for cable tv networks; located in Liege, it recently made interactive the Teldis cable system that has a pioneering role in satellite television reception (Teledis was the first cable net in Belgium to distribute the French TV5, the Italian RAI Uno and the British Sky Channel). Gillam developed for Teledis a unique monitoring station to control by computers CATV amplifiers and electricity distribution systems (the latter for the ALE - Association Liegeoise d'Electricite - network). It is improving the bi-directional capability of the Teledis CATV network in order to collect remotely data about electricity consumption in major industrial facilities.

Teledis contracted Gillam for supply of equipment to receive satellite TV signals from Eutelsat I-F1.

A first batch of seven earth stations is under construction for the Teledis network, which has some 210,000 subscribers and can carry up to 25 TV programmes. Each of these TVRO terminals consists of an aluminium parabola made by Precision Antennas and of demodulators developed by Gillam. The demodulator of Gillam has high performances, allowing 3 sound outputs and being remotely addressable. Every Gillam TVRO station, equipped with a 3.7m diameter antenna, costs around 600,000 Belgian Francs (some \$6000). Gillam also is marketing another TVRO terminal with 2.2m diameter antenna.

"Our next step, is the DBS market", Gillard states, we are negotiating the purchase of a French company, named SATEL, for the production of systems for cable networks and for individual DBS reception. We are working to be ready for the advent of the French TRF-1 system".

Gillam is really concerned by the development of the DBS services throughout Europe. It is competing for the EBU contract (European Broadcasting Union) related to the establishment at Jurbise (near Mons, Belgium) of a TVRO station for the acquisition of measurements covering DBS signals received from TV-Sat, TDF-1 and Olympus 1. It will for ESA study the development of DBS in Europe.

IBA LOOKING FOR INTEREST IN DBS

* The UK Independent Broadcasting Authority (IBA) has formally issued invitations to express interest in DBS TV. Invitations have been issued with guidance notes which are reprinted in full here with additional editorial comments. The IBA has also confirmed that it expects to be able to advise the Home Secretary on proposals for DBS "by about the turn of the year". Invitations have been issued to organizations interested in providing "one or more DBS television services" and other organizations who wish to provide relevant evidence about the circumstances necessary for DBS services to be successful. New guidelines clearly show a more flexible approach to DBS but retains some peculiarities, notably still tying close to WARC '77 and initially limiting the number of channels available to three.

GUIDANCE NOTES

1. A copy of Sections 37-41 of the Cable and Broadcasting Act 1984 is attached. With the exception of those provisions listed in Section 37(2), the provisions of the Broadcasting Act 1981 would also apply to IBA DBS television

services. Those interested are therefore advised to refer in addition to the 1981 Act.

2. The 1984 Act requires the contractor to make the financial and other arrangements for the provision of the satellite transponder(s). As the broadcasting authority, the IBA would be responsible for the uplink to the satellite. To meet the requirements of the 1981 Act for high quality as to transmission, and for the service to be available for as much of the United Kingdom as is reasonably practicable, the performance of the satellite and transponders would need to comply with conditions to be specified by the IBA. The IBA specification would be drawn up after consideration of views expressed about the satellite characteristics necessary for the service to be successful.

3. With regard to the source of satellite provision, it is to be assumed that there would be a freedom to consider proposals from suppliers either in this country or overseas. But it is also to be assumed that the Government would be opposed to any proposal in which an overseas supplier was quoted prices which were less than cost in order to gain access to the British DBS market, and that the nature and prospective size of the net industrial benefit to the UK of proposals will be a consideration to be taken into account by Government in deciding whether to proceed. Editorial Comment - this means no so called surplus to requirements satellite at a discount price. It opens the door to Britsat.

4. It is to be assumed also that the DBS transmissions provided would be in accordance with the provisions agreed at WARC 1977, and would be in the C-MAC (packet) standard as specified by the EBU in document SPB 284. The WARC provisions are for coverage of the United Kingdom from an orbital position of 31°W, at specified frequencies and polarisation, with satellite channel power of up to 230 watts. Five DBS channels are available to the UK. The Home Office has indicated that it would expect three of those channels to be initially available, for operation either by a single contractor or separately by different contractors.

Relevant Data

5. In order to enable the IBA to form a judgement on the feasibility of DBS television services under the terms of the 1981 and 1984 Acts, and of the conditions necessary for their success, those who wish to submit expressions of interest in providing such services are asked to include in their submissions as indication of their thinking on as many of the questions listed below as possible. It is expected that others who wish to provide evidence will wish to give views related to only a

few of the items. The list is not intended to be exhaustive: additional material on other aspects thought to be relevant would be welcome.

Number and nature of Channels.

What is the preferred number of channels for which you would wish to provide television service? What are the maximum, and minimum, numbers?

What are your proposals for the general nature of the programme content on the services you would provide? What are your estimated programme costs?

What use, if any, would you propose of the channel capacity available for sound or data services? How would such use be arranged, bearing in mind the terms of the 1981 and 1984 Acts?

What assumption do you make about other DBS services (whether UK or overseas), and other satellite services, available in the UK?

Structure

Would you intend to proceed as a DBS contractor on your own, or in collaboration with others?

If the latter, what type of structure is envisaged?

Revenue

What is your proposed source of revenue: subscription; advertising; other?

What revenue if any, do you expect to be forthcoming through use of data or sound channels?

What assumptions do you make about the build-up of an audience and of revenue?

If you would propose charging a subscription, what are your proposals (and cost-estimates) for encryption and decoding, and for the collection of subscriptions? What would be the expected monthly charge?

Finance

At what point during a twelve-year contract period (see Section 38 (1) of the 1984 Act) do you expect the project to break even?

What are your estimates of overall profitability?

What are your estimates of the funding required? What would be your expected sources of finances?

Satellite

What are your proposals for acquiring satellite capacity? What do you expect to be the period of the contract with the satellite provider?

What are your estimated satellite costs, including insurance?

What geographical coverage would you intend to provide? What minimum level of signal do you propose throughout the UK? What are your assumptions about satellite channel power?

What degree of assurance in service continuity do you regard as necessary? What degree of back-up do you propose?

What are your proposals for satellite control?

Receivers

What are your assumptions about dish size?

What are your estimates of the cost of reception equipment (including dishes and installation costs)?

What are your assumptions about delivery times?

Timing

What is the earliest commitment after the award of a programme contract that you would consider feasible for the start of the programme services?

6. It is intended that the review should be completed by the end of the calendar year. Those wishing to express an interest in providing DBS television services, or any organisations that wish to provide relevant evidence on particular aspects of such a project, are asked to contact the IBA before the end of October 1985. As a result of the review, the IBA will be submitting a report to the Home Secretary, the contents of which may also be made public. Where evidence is provided, or views are expressed, to the IBA on a confidential basis, this should be stated.

7. The IBA will be glad to have discussion with interested parties whether before or after they submit proposals. Communications should be addressed in the first instance to Kenneth Blyth, Chief Assistant to the Director General, IBA, 70 Brompton Road, London, SW3 1EY.

EBS CONCERNED ABOUT INTELSAT PROPOSALS

* Lief Lundquist, MD of EBS, tells us that he is working to have a first satellite in operation three years after the Swedish licence is granted to EBS. However he says "I have to admit that the situation is changing and very fluid in the field of communications satellites. I am concerned about the Intelsat pricing policy with the sale of transponders at \$3m - \$5m. I am curious to see how Eutelsat will react against this Intelsat dumping.

This new situation will, of course, affect the marketing of our transponders". Lundquist's position on Intelsat differs from that of new US satellite operators. The latter tend to "attack" and criticise Intelsat directly, whereas Lundquist sees the problem in terms of a joint carve up of the market by PTTs and Intelsat. European PTT's have not faced the constant political pressure that has been placed on Comsat to reduce the space segment tariff mark ups on Intelsat prices, partly because the PTT's are the users, whereas Comsat is an intermediary between the public networks and Intelsat.

Lundquist states that there has been some delays in the progress of the EBS project. "We have had some delays with the procedure to obtain the licence from Televerket to operate a European communications satellite system..... We have to wait till the end of this year to know the details of the licence (see last week's issue of Interspace) however, we have established subsidiaries in Norway and the United Kingdom..... The Swedish space committee has recommended unanimously to the government to proceed with the licence application of EBS".

"We are not competing with the Swedish Tele-X satellite covering specifically the Nordic countries and devoted especially for DBS Services. EBS will cover Europe for business services. However, we are competing with any FSS system in Europe".

The EBS system will consist of two operational FSS satellites, EBUS-1 and EBUS-2, operating in the 11/14 GHz band. Each satellite will have 16 active transponders with 20 - 30W of power output. EBS publicity states that the satellites will be of a type which has already been developed and tested in service., but that the technical and operational characteristics of the spacecraft are substantially more advanced than those of any other proposed or operational European satellite. This is because of the flexible access techniques which will be used in the EBS system. The system will permit customers to use a number of different types of advanced coding, modulation and access techniques. Lundquist states that "we have already discussed the space segment with Hughes, RCA Astro-Electronics and British Aerospace. We are interested in purchasing a 2nd hand communications satellites to accelerate the start of our operations.

EBS also states that a number of key persons are already lined up to staff the company, both for future employment and as consultants. At present about 20 people are engaged in the project. "The economic and administrative expertise which is necessary for the successful implementation of the project will be built up gradually within EBS with the assistance of MVC and its owners".

SATELLITE TELEVISION STATIONS IN WESTERN EUROPE (August 1985)

STATION NAME (Country of origin)	Satellite - position (frequency)	Category of Programmes (transmissions start)	Language (scrambling system)	Potential audience (countries allowing reception)
SKY CHANNEL (United Kingdom)	Eutelsat I-F1 - 13°E (11.650 GHz)	Commercial channel with entertainment, series, sports, pop music... (26 April 1982)	English (OAK-Orion)	4 million CATV and SMATV subscribers (Finland, Norway, Switzerland, Germany, United Kingdom, Austria, Netherlands, Sweden, France, Luxembourg, Belgium, Denmark...)
TV-5 (France)	Eutelsat I-F1 - 13°E (11.491 GHz)	Cultural public channel consisting of programmes from existing broadcasters of France, Switzerland, Belgium, Quebec-Canada (2 January 1984)	French (clear, but SECAM mode)	2.5 million CATV and SMATV subscribers (Belgium, Finland, Germany, Switzerland, France, United Kingdom, Netherlands, Norway, Sweden, Austria, Tunisia...)
MIRRORVISION (United Kingdom)	Intelsat VA-F10 - 27.5°W (11.175 GHz)	Pay-TV channel with movies (replacing TEN The Movie Channel, 29 March 1984)	English (clear)	Only for the CATV and SMATV networks in United Kingdom.
SCREEN SPORT (United Kingdom)	Intelsat VA-F10 - 27.5°W (11.135 GHz)	Pay-TV channel with sports from UK and USA (29 March 1985)	English (clear)	Originally for the CATV and SMATV networks of United Kingdom (trying to expand service to Sweden...)
SAT-1 (Germany)	Eutelsat I-F1 - 13°E (11.507 GHz)	Commercial channel with news, documentaries, series, films, entertainment... (1 April 1984)	German (scrambled sound signals)	Half million CATV and SMATV subscribers (Germany, Austria, Switzerland)
3-SAT (Germany)	Eutelsat I-F1 - 13°E (11.055 GHz)	Cultural public channel with programmes from German ZDF, Austrian ORF and Swiss SRG (1 April 1984)	German (transmitted via Spotbeam East, scrambled sound signals)	About 1 million CATV and SMATV subscribers (Germany, Austria, Switzerland)
TELECLUB/PAYSAT (Switzerland)	Eutelsat I-F1 - 13°E (10.099 GHz)	Pay-TV channel offering premium movie service for 28 Swiss Fr (3 May 1984)	German (clear)	About 260,000 CATV and SMATV subscribers (Switzerland, Austria, Germany)
RAI UNO (Italy)	Eutelsat I-F1 - 13°E (10.991 GHz)	Public channel broadcast by terrestrial means in Italy with news, movies, sports, entertainment... (1 June 1984)	Italian (clear)	Some 300,000 CATV and SMATV subscribers outside the peninsula (Belgium, Switzerland)
MUSIC BOX (United Kingdom)	Eutelsat I-F1 - 13°E (11.675 GHz)	Musical channel with advertising and pop music (12 July 1984)	English (clear)	Some 2.2 million CATV and SMATV subscribers (Finland, Switzerland, Sweden, Netherlands, Germany, Austria, Norway, United Kingdom...)
PREMIERE (United Kingdom)	Intelsat VA-F10 - 27.5°W (11.015 GHz)	Pay-TV channel offering premium movie service of the Thorn-EMI group (1 September 1984)	English (clear)	Some 150,000 CATV and SMATV subscribers only in the United Kingdom...
CHILDRENS CHANNEL (United Kingdom)	Intelsat VA-F10 - 27.5°W (11.015 GHz)	Commercial channel with entertainment and educational programmes for childrens (1 September 1984)	English (clear)	Some 150,000 CATV and SMATV subscribers (only in the United Kingdom)
NEW WORLD CHANNEL (Norway)	Eutelsat I-F1 - 13°E (11.491 GHz)	Multilingual religious programme, via the French repeater (1 October 1984)	English (clear, but SECAM mode)	Some 350,000 CATV and SMATV subscribers (Norway, Finland, Switzerland, Netherlands, United Kingdom...)
FILMNET/ATN (Belgium)	Eutelsat I-F1 - 13°E (11.158 GHz)	Pay-TV channel offering premium movie service and film classics (29 March 1985)	Dutch/English (clear)	Some 100,000 CATV and SMATV subscribers (Netherlands, on an experimental basis for a Belgian cable network)
WORLDNET (USA-France)	Eutelsat I-F1 - 13°E (11.491 GHz)	"Voice of America" TV programmes, live from Washington D.C. via Intelsat V-F3 at 24.5° West (22 April 1985)	English (clear)	Some 150,000 CATV and SMATV subscribers (Netherlands, Germany, Belgium...)
WORLD PUBLIC NEWS (Belgium)	Eutelsat I-F1 - 13°E (11.158 GHz)	News channel for current affairs, business activities, general interest (8 July 1985)	English (clear)	Some 160,000 CATV and SMATV subscribers (Belgium, as an experiment)
RTL PLUS (Luxembourg)	Eutelsat I-F1 - 13°E (Spotbeam East)	Commercial channel broadcast by terrestrial systems, consisting of news, sports, movies, entertainment (28 August 1985)	German (clear)	Some 200,000 CATV and SMATV subscribers outside Luxembourg and Belgium (Germany, Austria...)
OLYMPUS TV (Netherlands)	Eutelsat I-F1 - 13°E (11.158 GHz)	Multilingual public channel with programmes of EBU members that are Dutch NOS, German ARD, Italian RAI, Irish RTE and Portuguese RTP... (October 1985)	English (clear)	Only experimental transmissions received by CATV networks in the Netherlands.

(c) Space Information Center, Pepinster, Belgium

August 1985

COMPARATIVE TABLE OF SATELLITES FOR TELEVISION BROADCASTS

CHARACTERISTICS	LOW-POWER	MEDIUM-POWER	HIGH-POWER
Transponder power	15 to 30 W	30 to 60 W	100 to 250 W
Satellite type (ITU status)	Communications (FSS)	Communications (FSS)	Direct broadcasts (DBS)
EIRP per channel	35 to 45 dBW	45 to 55 dBW	55 to 65 dBW
TVRO antenna diameter	2 to 4 m	1 to 2 m	0.5 to 1 m
Transponder lease per year	2-5 million dollars	5-10 million dollars	10-15 million dollars
Operational satellites (frequencies)	RCA Satcom (C-band) Westar (C-band) Telstar (C-band) Galaxy (C-band) Spacenet (C-band) SBS (Ku-band) Eutelsat I (Ku-band) Telecom I (Ku-band) Intelsat V (Ku-band) Anik D (C-band) Brazilsat (C-band) Palapa (C-band) Morelos (C-band) Raduga (C-band)	Gorizont (C-band) Intelsat V and VA (Ku-band, Spotbeam) Insat I (S-band) Arabsat I (S-band) Aussat (Ku-band) Morelos (Ku-band) Anik C (Ku-band)	BS-2 (Ku-band) Ekran (UHF)
Satellites in project (frequencies)	Gstar (Ku-band) Comsat (Ku-band) Fordsat (C-band) Alascom (C-band) Kopernikus (Ku- -band) STW-China (C-band) Italsat (Ka-band) JCSat (Ku-band) PanAmSat (C-band) Spacecom (Ku-band and Ka-band)	RCA Satcom (Ku-band) Galaxy (Ku-band) Intelsat VI (Ku- -band) Fordsat (Ku-band) Eutelsat II (Ku- -band) SES-GDL (Ku-band) Proto-Insat II (S-band)	TV-sat (Ku-band) TDF-1 (Ku-band) Tele-X (Ku-band) Olympus (Ku-band) BS-3 (Ku-band) RCA-DBS (Ku-band) STC ? (Ku-band) USSB (Ku-band) DBSC (Ku-band) Dominion Video (Ku-band) Galaxy DBS (Ku- -band) SARIT (Ku-band)
Advantages of the systems	Low-cost and high- -reliability of the TV repeaters Many available transponders for TV broadcasts	Medium-cost and high-reliability of the TV repeaters Inexpensive TVRO terminals to be installed easily	Low-cost and easi- ly usable TV re- ceiving stations Powerful signals without strong interferences
Disadvantages of the systems	Expensive and com- plicated TVRO ter- minals Coordination re- quirements and risks of interfe- rences	Coordination requi- rements with other satellites Use restrictions related to the re- gulation for the communications sa- tellites	Expensive space segment with li- mited broadcasting services Still uncertain reliability of the highly power- ful repeaters
Conclusions/remarks	Interesting sys- tems for countries with important com- munities equipped with cable networks	Recommended systems for developing coun- tries with S-band or C-band broadcasts for the coverage of large territories with many TV broad- casts...	Useful systems for high-quality and new TV application -definition tele- vision (HDTV) channels
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